

REMARKS

Applicants acknowledge the Final Action of 6 JAN. 2011 and request that the Examiner exercise his discretion to enter the proposed amendments to main claim 1 and to dependent claims 5, 7, 23, 28, 29, 34, 38, 40, 43, and 44. The proposed amendments are mainly responsive to the formal objections made by the Office, so no new search or substantial consideration are believed necessary. Following is an explanation in response to the Final Action, are structured as follows:

1. a short discussion of the amendments to the claims,
2. a detailed discussion of amended independent claim 1,
3. a detailed discussion of HORNG,
4. a detailed discussion of ONO,
5. a detailed discussion of the rejection of independent claim 1 on the basis of HORNG in view of OOTSUKA, ONO and STRAND,
6. a hypothetical combination of HORNG and ONO, and
7. a conclusion.

1. The amended claims:

Claims 1, 5, 7, 23, 28, 29, 34, 38 to 40, 43 and 44, as proposed to be amended, are based on the corresponding previously-presented claims, in order to respond to the objections in paragraphs 1 to 18 of the Final Action dated JAN. 6, 2011. The proposed amendments remedy informalities and thus make the claims comply with 35 U.S.C. § 112. Previously-presented claim 32 has been cancelled, due to the objections in paragraphs 19 to 21 of the Action. The remaining previously-presented dependent claims are substantially unchanged.

2. Independent claim 1, as proposed to be amended:

Like previously-presented independent claim 1, currently amended independent claim 1 refers to a mini-fan having, *inter alia*, a bearing tube that is mounted in an associated fan housing and adapted to accommodate a bearing arrangement, in which a rotor shaft is rotatably supported. The bearing tube is closed off by a closure arrangement that is equipped with at least one resilient radially movable latching member, acting as a detent, for engaging into a necked-down portion of the rotor shaft, without disturbing normal operation of the rotor shaft, and thereby preventing non-destructive pulling-out of said rotor shaft from the bearing arrangement.

3. Subject matter of HORNG:

HORNG generally relates to a fixing structure for a rotor, and, more particularly, to a rotor of a brushless motor that can be detached and assembled easily (cp. col. 1, lines 8 to 10 of HORNG). More specifically, HORNG describes a brushless motor that includes a casing 1, an axle tube 2, a rotor 3, an engaging member 4, and a fixing ring 5. The casing 1 can be any conventional casing for a motor or heat-dissipating fan (cp. col. 2, lines 45 to 50 of HORNG). A bearing 21 is mounted in the axle tube 2 for rotatably holding a shaft 31 of the rotor 3 (cp. col. 2, lines 59 to 60 of HORNG).

The engaging member 4 is mounted to an inner flange 13 in an axle hole 12 of an axle seat 11 of the casing 1. The engaging member 4 may include a hole 41 with a plurality of notches 42 defined in an inner peripheral wall thereof, which can be of any desired shapes. A minimum inner diameter of the hole 41 of the engaging member 4 is slightly smaller than a diameter of the shaft 31 yet slightly greater than an outer diameter of a neck of the shaft 31 that forms an annular groove 32 (cp. col. 2, line 51 to col. 3, line 15 of HORNG).

During assembly, the shaft 31 may be inserted with a relatively large external force, and thus be forced to pass through the hole 41 of the engaging member 4. The protruding portions of the inner peripheral wall of the opening 41 are within the annular groove 32 of the shaft 31 after assembly. The notches 42 in the inner periphery of the opening 41 allow the inner peripheral wall of the hole 41 to bend and deform in axial direction of the shaft 31 (cp. figure 7 of HORNG) during passage of the shaft 31, thereby allowing passage of the distal end of the shaft 31 (cf. col. 3, lines 16 to 25 and figures 7 & 8 of HORNG).

According to col. 3, lines 35 to 63 of HORNG, the fixing ring 5 and the engaging member 4 are mounted during assembly into the axle hole 12 of the axle seat 11 of the casing 1 and retained to the inner flange 13. Then, the axle tube 2 having the bearing 21 mounted therein is mounted into the axle seat 11 with an end face of the bearing 21 bearing against the fixing ring 5, which, in turn, retains the engaging member 4 in place. Finally, the shaft 31 of the rotor 3 is extended through the hole of the bearing 21 and forcibly passed through the hole 41 of the engaging member 4. The distal end of the shaft 31 has a spherical surface and the hole 41 of the engaging member 4 that is retained in place by the fixing ring 5 includes a plurality of notches 42 to allow deformation in the inner peripheral wall of the hole 41 during passage of the distal end of the shaft 31.

After passing through the hole 41 of the engaging member 4, the inner peripheral wall of the hole 41 returns to its original position and is located in the annular groove 32 of the distal end of the shaft 31 without contacting the neck of the shaft 31. Disengagement of the rotor 3 is prevented by the engaging member 4, as the diameter of the hole 41 of the engaging member 4 is slightly smaller than the diameter of the shaft 31.

When detachment of the rotor 3 is required, a relatively greater force can be applied to pull the rotor 3 outward. A side wall defining the annular groove 32 of the shaft 31 presses against the inner peripheral wall of the hole 41 of the engaging member 4 and thus causes outward deformation of the inner peripheral wall of the hole 41 of the engaging member 4. This allows easy removal of the rotor 3 (cf. col. 3, line 64 to col. 4, line 4 of HORNG).

4. Subject matter of ONO:

ONO describes a spindle motor having a rotor 6 with a shaft 4 that is inserted into a radial bearing 3 which is accommodated in an axial attachment component 1. The shaft 4 has a crevice 4a and is held in the radial bearing 3 by means of a thrust pad 5 (cp. ONO, paragraphs 0003 to 0005, 0023, 0025, and figures 1 & 2).

The thrust pad 5 is fixed to the bottom of the axial attachment component 1 and has a cylindrical slip off stop member 13 provided with an annular tip inner circumference part 13a. The annular tip inner circumference part 13a has an elastic body which carries out elastic deformation with insertion of the shaft 4 into the axial attachment component 1 (cp. ONO, paragraphs 0024 to 0025).

According to ONO, paragraph 0026, when the shaft 4 is inserted into the bearing 3 and the slip off stop member 13, the annular tip inner circumferential part 13a is extended and when the shaft 4 contacts the thrust pad 5, bending thereof returns until the annular tip inner circumferential part 13a is arranged in the crevice 4a of shaft 4, as shown in figures 1 and 2 of ONO.

5. Rejection of independent claim 1 on the basis of HORNG in view of OOTSUKA, ONO and STRAND

The Office has rejected independent claim 1 as being unpatentable over HORNG, in view of OOTSUKA, ONO and STRAND. Specifically, the Office has contended that HORNG contains every element and limitation recited in claim 1, except the radial protrusion which abuts against a shoulder, the latching member being integrally formed and the closure arrangement being made at least partially of thermoplastic material and laser welded to form the desired fluid tight connection, which are described by OOTSUKA, ONO and STRAND, and that it would have been obvious, to one of ordinary skill in the art, to combine the teachings of these prior art references with the teachings of HORNG, as is required for an obviousness rejection under 35 U.S.C. § 103(a) according to MPEP § 2142.

Applicants cannot agree with this opinion.

More specifically, the Office has failed to establish a *prima facie* case of obviousness, as required according to MPEP § 2142. The rejection does not meet the basic criterion that there must be *some suggestion or motivation*, either in HORNG and/or OOTSUKA and/or ONO and/or STRAND or in the general knowledge of a person skilled in the art, to modify HORNG in view of OOTSUKA, ONO and STRAND or to combine their teachings in a manner which would reach the subject-matter of independent claim 1.

However, as described in more detail below, HORNG, OOTSUKA, ONO and STRAND lack motivation for combination with respect to previously presented and currently amended independent claim 1, as required according to MPEP § 2142.

More specifically, from the description under paragraph 3 above, it is clear that HORNG merely describes an engaging member 4 with an opening 41 having protruding portions and notches 42 in the inner periphery that allow the inner peripheral wall of the hole 41 to bend and deform in axial direction of the shaft 31 during passage of the shaft 31 (cp. figure 7 of HORNG). In other words, HORNG clearly does not describe " [...] at least one resilient radially movable latching member (60; 260), acting as a detent, for engaging into that necked-down portion (58; 258) of the rotor shaft (234) without disturbing normal operation of said rotor shaft (34; 234) and thereby preventing non-destructive pulling of said rotor shaft out of said bearing arrangement (36; 236), [...] ".

Furthermore, as indicated under item 3 above, HORNG describes a fixing structure for a rotor of a brushless motor that can be detached and assembled easily (cp. col. 1, lines 8 to 10 of HORNG). Moreover, according to col. 1, lines 49 to 51 of HORNG, the primary object of HORNG is to provide a fixing structure for a rotor to allow easy assembly and detachment and to reduce rotational noise of the rotor. This is again pointed out in col. 4, lines 3 to 4 of HORNG, where it is mentioned that "*This allows easy removal of the rotor 3.*", and in col. 4, lines 15 to 18 of HORNG, where it is mentioned that " [...] detachment of the rotor after assembly can be easily achieved by means of simply pulling the rotor outward without causing damage to other elements.".

In other words, HORNG **clearly teaches away from** the subject matter of independent claim 1 which refers to preventing non-destructive pulling of said rotor shaft out of said bearing arrangement. Thus, there is no motivation for the person skilled in the art to combine the teachings of HORNG with any of the other cited prior art references. More specifically, the person having ordinary skill in the art would not consider to combine HORNG with any other cited prior art document in order to achieve a mini fan having a resilient radially movable latching member adapted for preventing pulling of said rotor shaft out of said bearing arrangement, because HORNG clearly indicates the benefits of the annular engaging member for an easy assembling and detaching of the rotor to the brushless motor. Accordingly, the Examiner's suggestion to combine HORNG with OOTSUKA, ONO and STRAND can only be based on the use of impermissible hindsight. Thus, the obviousness rejection of main claim 1, under 35 U.S.C. § 103(a), is not supported by the cited prior art. Reconsideration of the rejection of claim 1 is solicited.

6. Hypothetical combination of HORNG and ONO

From the description under paragraph 5 above, it is clear that HORNG does not describe " [...] at least one resilient radially movable latching member (60; 260), acting as a detent, for engaging into that necked-down portion (58; 258) of the rotor shaft (234) without disturbing normal operation of said rotor shaft (34; 234) and thereby preventing pulling of said rotor shaft out of said bearing arrangement (36; 236), [...] ". Furthermore, from the description under paragraph 4 above it is clear that ONO also does not describe a resilient radially movable latching member. Instead, ONO merely describes a cylindrical slip off stop member provided with an annular tip inner circumference part that can be elastically deformed in axial direction of the shaft.

However, it should be clear to the person having ordinary skill in the art that the cylindrical slip-off stop member 13 and the inner periphery of the axial attachment component 1, as shown in figures 1 and 2 of ONO, would prevent the annular tip inner circumference part from radially moving.

Accordingly, even a hypothetical combination of HORNG and ONO would not teach all claim limitations with respect to independent claim 1, as would be required to support an obviousness rejection under 35 U.S.C. § 103(a) according to MPEP § 2143, because such a combination would not teach a resilient radially movable latching member.

It should also be noted that none of the remaining cited prior art references describes such a resilient radially movable latching member. Accordingly, even a hypothetical combination of HORNG and/or ONO with any one of the remaining cited prior art references would not teach all claim limitations with respect to independent claim 1. Thus, the obviousness rejection under 35 U.S.C. § 103(a) against independent claim 1 is not supported by the cited prior art and should be withdrawn.

CONCLUSION

From the foregoing explanation, it should be clear that the Office's rejections are not supported by the cited prior art HORNG, OOTSUKA, ONO and STRAND. More specifically, it has been demonstrated that none of the cited prior art references describes all claim limitations of independent claim 1, as proposed to be amended. Thus, independent claim 1 and its dependent claims are clearly novel, and teach an unobvious improvement over the cited references and over any hypothetical combination thereof.

The claims are believed in condition for allowance. Nevertheless, if the Examiner notes any remaining informalities, or wishes to make any suggestions to place the application

in condition for allowance, the Examiner is invited to contact Applicants' counsel, for prompt resolution of any remaining issues.

Respectfully submitted,

/Milton Oliver/

Milton Oliver, Atty for Applicants
OLIVER INTELLECTUAL PROPERTY LLC
CUST. # 83409
TEL: 781-910-9664 or 774-521-3058
FAX: 774-521-3062

EMAIL: MILTONOLIVER@IEEE.org

Attorney docket: 870-003-200